



SEQUENCE LISTING

<110> Henson, Cynthia A.
Muslin, Elizabeth H.
Clark, Suzanne E.

<120> Modified barley alpha-glucosidase

<130> 960296.97486

<140> 10/043,418

<141> 2002-01-10

<150> 60/260,787

<151> 2001-01-10

<160> 7

<170> PatentIn Ver. 2.1

<210> 1

<211> 877

<212> PRT

<213> Barley

<400> 1

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Thr Val Leu Ala Val Ala Val Thr Met Glu Gly Ala Leu Arg Ala Glu
35 40 45

Ala Ala Thr Gly Gly Arg Ser Ser Thr Gly Asp Val Gln Arg Leu Ala
50 55 60

Val Tyr Ala Ser Leu Glu Thr Asp Ser Arg Leu Arg Val Arg Ile Thr
65 70 75 80

Asp Ala Asp His Pro Arg Trp Glu Val Pro Gln Asp Ile Ile Pro Arg
85 90 95

Pro Ala Pro Gly Asp Val Leu His Asp Ala Pro Pro Ala Ser Ser Ala
100 105 110

Pro Leu Gln Gly Arg Val Leu Ser Pro Ala Gly Ser Asp Leu Val Leu

115		120		125
Thr Val His Ala Ser Pro Phe Arg Phe Thr Val Ser Arg Arg Ser Thr				
130		135		140
Gly Asp Thr Leu Phe Asp Thr Ala Pro Gly Leu Val Phe Arg Asp Lys				
145		150		155 160
Tyr Leu Glu Val Thr Ser Ala Leu Pro Ala Gly Arg Ala Ser Leu Tyr				
	165		170	175
Gly Leu Gly Glu His Thr Lys Ser Ser Phe Arg Leu Arg His Asn Asp				
	180		185	190
Ser Phe Thr Leu Trp Asn Ala Asp Ile Gly Ala Ser Tyr Val Asp Val				
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Asn Leu Tyr Gly Ser His Pro Phe Tyr Met Asp Val Arg Ala Pro Gly				
	210		215	220
Thr Ala His Gly Val Leu Leu Leu Ser Ser Asn Gly Met Asp Val Leu				
225		230		235 240
Tyr Gly Gly Ser Tyr Val Thr Tyr Lys Val Ile Gly Gly Val Leu Asp				
	245		250	255
Phe Tyr Phe Phe Ala Gly Pro Asn Pro Leu Ala Val Val Asp Gln Tyr				
	260		265	270
Thr Gln Leu Ile Ala Arg Pro Ala Pro Met Pro Tyr Trp Ser Phe Gly				
	275		280	285
Phe His Gln Cys Arg Tyr Gly Tyr Leu Asn Val Ser Asp Leu Glu Arg				
	290		295	300
Val Val Ala Arg Tyr Ala Lys Ala Arg Ile Pro Leu Glu Val Met Trp				
305		310		315 320
Thr Asp Ile Asp Tyr Met Asp Gly Phe Lys Asp Phe Thr Leu Asp Arg				
	325		330	335
Val Asn Phe Thr Ala Ala Glu Leu Arg Pro Phe Val Asp Arg Leu His				
	340		345	350
Arg Asn Ala Gln Lys Tyr Val Leu Ile Leu Asp Pro Gly Ile Arg Val				
	355		360	365
Asp Pro Ile Asp Ala Thr Tyr Gly Thr Phe Val Arg Gly Met Gln Gln				

370

375

380

Asp Ile Phe Leu Lys Arg Asn Gly Thr Asn Phe Val Gly Asn Val Trp
 385 390 395 400

Pro Gly Asp Val Tyr Phe Pro Asp Phe Met His Pro Ala Ala Ala Glu
 405 410 415

Phe Trp Ala Arg Glu Ile Ser Leu Phe Arg Arg Thr Ile Pro Val Asp
 420 425 430

Gly Leu Trp Ile Asp Met Asn Glu Ile Ser Asn Phe Tyr Asn Pro Glu
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Pro Met Asn Ala Leu Asp Asp Pro Pro Tyr Arg Ile Asn Asn Asp Gly
 450 455 460

Thr Gly Arg Pro Ile Asn Asn Lys Thr Val Arg Pro Leu Ala Val His
 465 470 475 480

Tyr Gly Gly Val Thr Glu Tyr Glu Glu His Asn Leu Phe Gly Leu Leu
 485 490 495

Glu Ala Arg Ala Thr Gly Arg Gly Val Leu Arg Asp Thr Gly Arg Arg
 500 505 510

Pro Phe Val Leu Ser Arg Ser Thr Phe Val Gly Ser Gly Arg Tyr Thr
 515 520 525

Ala Tyr Trp Thr Gly Asp Asn Ala Ala Thr Trp Gly Asp Leu Arg Tyr
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Ser Ile Asn Thr Met Leu Ser Phe Gly Leu Phe Gly Met Pro Met Ile
 545 550 555 560

Gly Ala Asp Ile Cys Gly Phe Asn Gly Asn Thr Thr Glu Glu Leu Cys
 565 570 575

Gly Arg Trp Ile Gln Leu Gly Ala Phe Tyr Pro Phe Ser Arg Asp His
 580 585 590

Ser Ala Ile Phe Thr Val Arg Arg Glu Leu Tyr Leu Trp Pro Ser Val
 595 600 605

Ala Ala Ser Gly Arg Lys Ala Leu Gly Leu Arg Tyr Gln Leu Leu Pro
 610 615 620

Tyr Phe Tyr Thr Leu Met Tyr Glu Ala His Met Thr Gly Ala Pro Ile

625 630 635 640
 Ala Arg Pro Leu Phe Phe Ser Tyr Pro His Asp Val Ala Thr Tyr Gly
 645 650 655
 Val Asp Arg Gln Phe Leu Leu Gly Arg Gly Val Leu Val Ser Pro Val
 660 665 670
 Leu Glu Pro Gly Pro Thr Thr Val Asp Ala Tyr Phe Pro Ala Gly Arg
 675 680 685
 Trp Tyr Arg Leu Tyr Asp Tyr Ser Leu Ala Val Ala Thr Arg Thr Gly
 690 695 700
 Lys His Val Arg Leu Pro Ala Pro Ala Asp Thr Val Asn Val His Leu
 705 710 715 720
 Thr Gly Gly Thr Ile Leu Pro Leu Gln Gln Ser Ala Leu Thr Thr Ser
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 Arg Ala Arg Arg Thr Ala Phe His Leu Leu Val Ala Leu Ala Glu Asp
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 Gly Thr Ala Ser Gly Tyr Leu Phe Leu Asp Asp Gly Asp Ser Pro Glu
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 Tyr Gly Arg Arg Ser Asp Trp Ser Met Val Arg Phe Asn Tyr Lys Ile
 770 775 780
 Pro Asn Asn Lys Gly Ala Ile Lys Val Lys Ser Glu Val Val His Asn
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 Ser Tyr Ala Gln Ser Arg Thr Leu Val Ile Ser Lys Val Val Leu Met
 805 810 815
 Gly His Arg Ser Pro Ala Ala Pro Lys Lys Leu Thr Val His Val Asn
 820 825 830
 Ser Ala Glu Val Glu Ala Ser Ser Ser Ala Gly Thr Arg Tyr Gln Asn
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 Val Gly Glu Glu Phe Glu Leu Lys Val Ala Met Ser Tyr
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<210> 2
 <211> 914
 <212> PRT
 <213> Sugar beet

<400> 2

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Lys	Asn	Asp	Asn	Gln	Gly	Glu	Ala	Ile	Gly	Tyr	Gly	Tyr	Gln	Val	Lys	35	40	45	
Asn	Ala	Lys	Val	Asp	Asn	Ser	Thr	Gly	Lys	Ser	Leu	Thr	Ala	Leu	Leu	50	55	60	
Gln	Leu	Ile	Arg	Asn	Ser	Pro	Val	Tyr	Gly	Pro	Asp	Ile	His	Phe	Leu	65	70	75	80
Ser	Phe	Thr	Ala	Ser	Phe	Glu	Glu	Asp	Asp	Thr	Leu	Arg	Ile	Arg	Phe	85	90	95	
Thr	Asp	Ala	Asn	Asn	Arg	Arg	Trp	Glu	Ile	Pro	Asn	Glu	Val	Leu	Pro	100	105	110	
Arg	Pro	Pro	Pro	Pro	Pro	Ser	Pro	Pro	Pro	Leu	Ser	Ser	Leu	Gln	His	115	120	125	
Leu	Pro	Lys	Pro	Ile	Pro	Gln	Asn	Gln	Pro	Thr	Thr	Thr	Val	Leu	Ser	130	135	140	
His	Pro	His	Ser	Asp	Leu	Ala	Phe	Thr	Leu	Phe	His	Thr	Thr	Pro	Phe	145	150	155	160
Gly	Phe	Thr	Ile	Tyr	Arg	Lys	Ser	Thr	His	Asp	Val	Leu	Phe	Asp	Ala	165	170	175	
Thr	Pro	Ile	Pro	Ser	Asn	Pro	Thr	Thr	Phe	Leu	Ile	Tyr	Lys	Asp	Gln	180	185	190	
Tyr	Leu	Gln	Leu	Ser	Ser	Ser	Leu	Pro	Ala	Gln	Gln	Ala	His	Leu	Tyr	195	200	205	
Gly	Leu	Gly	Glu	His	Thr	Lys	Pro	Thr	Phe	Gln	Leu	Ala	His	Asn	Gln	210	215	220	

Ile	Leu	Thr	Leu	Trp	Asn	Ala	Asp	Ile	Ala	Ser	Phe	Asn	Arg	Asp	Leu	
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Asn	Leu	Tyr	Gly	Ser	His	Pro	Phe	Tyr	Met	Asp	Val	Arg	Ser	Ser	Pro	
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Met	Val	Gly	Ser	Thr	His	Gly	Val	Phe	Leu	Leu	Asn	Ser	Asn	Gly	Met	
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Asp	Val	Glu	Tyr	Thr	Gly	Asp	Arg	Ile	Thr	Tyr	Lys	Val	Ile	Gly	Gly	
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Ile	Ile	Asp	Leu	Tyr	Ile	Phe	Ala	Gly	Arg	Thr	Pro	Glu	Met	Val	Leu	
	290					295					300					
Asp	Gln	Tyr	Thr	Lys	Leu	Ile	Gly	Arg	Pro	Ala	Pro	Met	Pro	Tyr	Trp	
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Ala	Phe	Gly	Phe	His	Gln	Cys	Arg	Trp	Gly	Tyr	Arg	Asp	Val	Asn	Glu	
				325					330					335		
Ile	Glu	Thr	Val	Val	Asp	Lys	Tyr	Ala	Glu	Ala	Arg	Ile	Pro	Leu	Glu	
			340					345					350			
Val	Met	Trp	Thr	Asp	Ile	Asp	Tyr	Met	Asp	Ala	Phe	Lys	Asp	Phe	Thr	
			355				360					365				
Leu	Asp	Pro	Val	His	Phe	Pro	Leu	Asp	Lys	Met	Gln	Gln	Phe	Val	Thr	
	370					375					380					
Lys	Leu	His	Arg	Asn	Gly	Gln	Arg	Tyr	Val	Pro	Ile	Leu	Asp	Pro	Gly	
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Ile	Asn	Thr	Asn	Lys	Ser	Tyr	Gly	Thr	Phe	Ile	Arg	Gly	Met	Gln	Ser	
				405					410					415		
Asn	Val	Phe	Ile	Lys	Arg	Asn	Gly	Asn	Pro	Tyr	Leu	Gly	Ser	Val	Trp	
			420					425					430			
Pro	Gly	Pro	Val	Tyr	Tyr	Pro	Asp	Phe	Leu	Asp	Pro	Ala	Ala	Arg	Ser	
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Phe	Trp	Val	Asp	Glu	Ile	Lys	Arg	Phe	Arg	Asp	Ile	Leu	Pro	Ile	Asp	
	450					455					460					
Gly	Ile	Trp	Ile	Asp	Met	Asn	Glu	Ala	Ser	Asn	Phe	Ile	Thr	Ser	Ala	
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Pro Thr Pro Gly Ser Thr Leu Asp Asn Pro Pro Tyr Lys Ile Asn Asn
 485 490 495

Ser Gly Gly Arg Val Pro Ile Asn Ser Lys Thr Ile Pro Ala Thr Ala
 500 505 510

Met His Tyr Gly Asn Val Thr Glu Tyr Asn Ala His Asn Leu Tyr Gly
 515 520 525

Phe Leu Glu Ser Gln Ala Thr Arg Glu Ala Leu Val Arg Pro Ala Thr
 530 535 540

Arg Gly Pro Phe Leu Leu Ser Arg Ser Thr Phe Ala Gly Ser Gly Lys
 545 550 555 560

Tyr Thr Ala His Trp Thr Gly Asp Asn Ala Ala Arg Trp Asp Asp Leu
 565 570 575

Gln Tyr Ser Ile Pro Thr Met Leu Asn Phe Gly Leu Phe Gly Met Pro
 580 585 590

Met Ile Gly Ala Asp Ile Cys Gly Phe Ala Glu Ser Thr Thr Glu Glu
 595 600 605

Leu Cys Cys Arg Trp Ile Gln Leu Gly Ala Phe Tyr Pro Phe Ser Arg
 610 615 620

Asp His Ser Ala Arg Asp Thr Thr His Gln Glu Leu Tyr Leu Trp Glu
 625 630 635 640

Ser Val Ala Ala Ser Ala Arg Thr Val Leu Gly Leu Arg Tyr Glu Leu
 645 650 655

Leu Pro Tyr Tyr Tyr Thr Leu Met Tyr Asp Ala Asn Leu Arg Gly Ser
 660 665 670

Pro Ile Ala Arg Pro Leu Ser Phe Thr Phe Pro Asp Asp Val Ala Thr
 675 680 685

Tyr Gly Ile Ser Ser Gln Phe Leu Ile Gly Arg Gly Ile Met Val Ser
 690 695 700

Pro Val Leu Gln Pro Gly Ser Ser Ile Val Asn Ala Tyr Ser Pro Arg
 705 710 715 720

Gly Asn Trp Val Ser Leu Ser Asn Tyr Thr Ser Ser Val Ser Val Ser
 725 730 735

Ala Gly Thr Tyr Val Ser Leu Ser Ala Pro Pro Asp His Ile Asn Val
740 745 750

His Ile His Glu Gly Asn Ile Val Ala Met Gln Gly Glu Ala Met Thr
755 760 765

Thr Gln Ala Ala Arg Ser Thr Pro Phe His Leu Leu Val Val Met Ser
770 775 780

Asp His Val Ala Ser Thr Gly Glu Leu Phe Leu Asp Asn Gly Ile Glu
785 790 795 800

Met Asp Ile Gly Gly Pro Gly Gly Lys Trp Thr Leu Val Arg Phe Phe
805 810 815

Ala Glu Ser Gly Ile Asn Asn Leu Thr Ile Ser Ser Glu Val Val Asn
820 825 830

Arg Gly Tyr Ala Met Ser Gln Arg Trp Val Met Asp Lys Ile Thr Ile
835 840 845

Leu Gly Leu Lys Arg Arg Val Lys Ile Lys Glu Tyr Thr Val Gln Lys
850 855 860

Asp Ala Gly Ala Ile Lys Val Lys Gly Leu Gly Arg Arg Thr Ser Ser
865 870 875 880

His Asn Gln Gly Gly Phe Phe Val Ser Val Ile Ser Asp Leu Arg Gln
885 890 895

Leu Val Gly Gln Ala Phe Lys Leu Glu Leu Glu Phe Glu Gly Ala Thr
900 905 910

Arg Val

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<212> PRT
<213> Spinach

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Glu Gly Val Ile Gly Tyr Gly Tyr Lys Val Lys Ser Val Lys Val Asp
35 40 45

Ser Gly Thr Arg Arg Ser Leu Thr Ala Leu Pro Gln Leu Val Lys Asn
50 55 60

Ser Ser Val Tyr Gly Pro Asp Ile Gln Leu Leu Ser Ile Thr Ala Ser
65 70 75 80

Leu Glu Ser Asn Asp Arg Leu Arg Val Arg Ile Thr Asp Ala Lys His
85 90 95

Arg Arg Trp Glu Ile Pro Asp Asn Ile Leu His Arg His Gln Pro Pro
100 105 110

Pro Pro Pro Pro His Ser Leu Ser Ser Leu Tyr Arg Thr Leu Leu Ser
115 120 125

Ser Pro Thr Thr Asn Arg Arg Lys Ile Leu Leu Ser His Pro Asn Ser
130 135 140

Asp Leu Thr Phe Ser Leu Ile Asn Thr Thr Pro Phe Gly Phe Thr Ile
145 150 155 160

Ser Arg Lys Ser Thr His Asp Val Leu Phe Asp Ala Thr Pro Asp Pro
165 170 175

Thr Asn Pro Asn Thr Phe Leu Ile Phe Ile Asp Gln Tyr Leu His Leu
180 185 190

Thr Ser Ser Leu Pro Gly Thr Arg Ala His Ile Tyr Gly Leu Gly Glu
195 200 205

His Ser Lys Pro Thr Phe Gln Leu Ala His Asn Gln Thr Leu Thr Met
210 215 220

Arg Ala Ala Asp Ile Pro Ser Ser Asn Pro Asp Val Asn Leu Tyr Gly
225 230 235 240

Ser His Pro Phe Tyr Met Asp Val Arg Ser Ser Pro Val Ala Gly Ser
245 250 255

Thr His Gly Val Leu Leu Leu Asn Ser Asn Gly Met Asp Val Glu Tyr
260 265 270

Thr Gly Asn Arg Ile Thr Tyr Lys Val Ile Gly Gly Ile Ile Asp Leu
275 280 285

Tyr Phe Phe Ala Gly Pro Ser Pro Gly Gln Val Val Glu Gln Phe Thr
 290 295 300
 Arg Val Ile Gly Arg Pro Ala Pro Met Pro Tyr Trp Ala Phe Gly Phe
 305 310 315 320
 Gln Gln Cys Arg Tyr Gly Tyr His Asp Val Tyr Glu Leu Gln Ser Val
 325 330 335
 Val Ala Gly Tyr Ala Lys Ala Lys Ile Pro Leu Glu Val Met Trp Thr
 340 345 350
 Asp Ile Asp Tyr Met Asp Ala Tyr Lys Asp Phe Thr Leu Asp Pro Val
 355 360 365
 Asn Phe Pro Leu Asp Lys Met Lys Lys Phe Val Asn Asn Leu His Lys
 370 375 380
 Asn Gly Gln Lys Tyr Val Val Ile Leu Asp Pro Gly Ile Ser Thr Asn
 385 390 395 400
 Lys Thr Tyr Glu Thr Tyr Ile Arg Gly Met Lys His Asp Val Phe Leu
 405 410 415
 Lys Arg Asn Gly Lys Pro Tyr Leu Gly Ser Val Trp Pro Gly Pro Val
 420 425 430
 Tyr Phe Pro Asp Phe Leu Lys Pro Ser Ala Leu Thr Phe Trp Thr Asp
 435 440 445
 Glu Ile Lys Arg Phe Leu Asn Leu Leu Pro Val Asp Gly Leu Trp Ile
 450 455 460
 Asp Met Asn Glu Ile Ser Asn Phe Ile Ser Ser Pro Pro Ile Pro Gly
 465 470 475 480
 Ser Thr Leu Asp Asn Pro Pro Tyr Lys Ile Asn Asn Ser Gly Val Met
 485 490 495
 Leu Pro Ile Ile Asn Lys Thr Ile Pro Pro Thr Ala Met His Tyr Gly
 500 505 510
 Asp Ile Pro Glu Tyr Asn Val His Asn Leu Phe Gly Tyr Leu Glu Ala
 515 520 525
 Arg Val Thr Arg Ala Ala Leu Ile Lys Leu Thr Glu Lys Arg Pro Phe
 530 535 540

Val Leu Ser Arg Ser Thr Phe Ser Gly Ser Gly Lys Tyr Thr Ala His
 545 550 555 560
 Trp Thr Gly Asp Asn Ala Ala Thr Trp Asn Asp Leu Val Tyr Ser Ile
 565 570 575
 Pro Ser Met Leu Asp Phe Gly Leu Phe Gly Ile Pro Met Val Gly Ala
 580 585 590
 Asp Ile Cys Gly Phe Leu Gly Asn Thr Thr Glu Glu Leu Cys Arg Arg
 595 600 605
 Trp Ile Gln Leu Gly Ala Phe Tyr Pro Phe Ser Arg Asp His Ser Ser
 610 615 620
 Leu Gly Thr Thr Tyr Gln Glu Leu Tyr Arg Trp Glu Ser Val Ala Ala
 625 630 635 640
 Ser Ala Arg Lys Val Leu Gly Leu Arg Tyr Thr Leu Leu Pro Tyr Phe
 645 650 655
 Tyr Thr Leu Met Tyr Glu Ala Gln Leu Asn Gly Ile Pro Ile Ala Arg
 660 665 670
 Pro Leu Phe Phe Ser Phe Pro Asp Asp Ile Lys Thr Tyr Gly Ile Ser
 675 680 685
 Ser Gln Phe Leu Leu Gly Lys Gly Val Met Val Ser Pro Val Leu Lys
 690 695 700
 Pro Gly Val Val Ser Val Thr Ala Tyr Phe Pro Arg Gly Asn Trp Phe
 705 710 715 720
 Asp Leu Phe Asp Tyr Thr Arg Ser Val Thr Ala Ser Thr Gly Arg Tyr
 725 730 735
 Val Thr Leu Ser Ala Pro Pro Asp His Ile Asn Val His Ile Gln Glu
 740 745 750
 Gly Asn Ile Leu Ala Met Gln Gly Lys Ala Met Thr Thr Gln Ala Ala
 755 760 765
 Arg Lys Thr Pro Phe His Leu Leu Val Val Met Ser Asp Cys Gly Ala
 770 775 780
 Ser Phe Gly Glu Leu Phe Leu Asp Asp Gly Val Glu Val Thr Met Gly
 785 790 795 800

Val Asn Arg Gly Lys Trp Thr Phe Val Lys Phe Ile Ala Ala Ser Ala
805 810 815

Lys Gln Thr Cys Ile Ile Thr Ser Asp Val Val Ser Gly Glu Phe Ala
820 825 830

Val Ser Gln Lys Trp Val Ile Asp Lys Val Thr Ile Leu Gly Leu Arg
835 840 845

Lys Gly Thr Lys Ile Asn Gly Tyr Thr Val Arg Thr Gly Ala Val Thr
850 855 860

Arg Lys Gly Asp Lys Ser Lys Leu Lys Ser Thr Pro Asp Arg Lys Gly
865 870 875 880

Glu Phe Ile Val Ala Glu Ile Ser Gly Leu Asn Leu Leu Leu Gly Arg
885 890 895

Glu Phe Lys Leu Val Leu His
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Thr Val Val Gly Tyr Gly Tyr Val Val Arg Ser Val Gly Val Asp Ser
35 40 45

Asn Arg Gln Val Leu Thr Ala Lys Leu Asp Leu Ile Lys Pro Ser Ser
50 55 60

Val Tyr Ala Pro Asp Ile Lys Ser Leu Asn Leu His Val Ser Leu Glu
65 70 75 80

Thr Ser Glu Arg Leu Arg Ile Arg Ile Thr Asp Ser Ser Gln Gln Arg
85 90 95

Trp Glu Ile Pro Glu Thr Val Ile Pro Arg Ala Gly Asn His Ser Pro

100	105	110
Arg Arg Phe Ser Thr Glu Glu Asp Gly Gly Asn Ser Pro Glu Asn Asn		
115	120	125
Phe Leu Ala Asp Pro Ser Ser Asp Leu Val Phe Thr Leu His Asn Thr		
130	135	140
Thr Pro Phe Gly Phe Ser Val Ser Arg Arg Ser Ser Gly Asp Ile Leu		
145	150	155
Phe Asp Thr Ser Pro Asp Ser Ser Asp Ser Asn Thr Tyr Phe Ile Phe		
165	170	175
Lys Asp Gln Phe Leu Gln Leu Ser Ser Ala Leu Pro Glu Asn Arg Ser		
180	185	190
Asn Leu Tyr Gly Ile Gly Glu His Thr Lys Arg Ser Phe Arg Leu Ile		
195	200	205
Pro Gly Glu Thr Met Thr Leu Trp Asn Ala Asp Ile Gly Ser Glu Asn		
210	215	220
Pro Asp Val Asn Leu Tyr Gly Ser His Pro Phe Tyr Met Asp Val Arg		
225	230	235
Gly Ser Lys Gly Asn Glu Glu Ala Gly Thr Thr His Gly Val Leu Leu		
245	250	255
Leu Asn Ser Asn Gly Met Asp Val Lys Tyr Glu Gly His Arg Ile Thr		
260	265	270
Tyr Asn Val Ile Gly Gly Val Ile Asp Leu Tyr Val Phe Ala Gly Pro		
275	280	285
Ser Pro Glu Met Val Met Asn Gln Tyr Thr Glu Leu Ile Gly Arg Pro		
290	295	300
Ala Pro Met Pro Tyr Trp Ser Phe Gly Phe His Gln Cys Arg Tyr Gly		
305	310	315
Tyr Lys Asn Val Ser Asp Leu Glu Tyr Val Val Asp Gly Tyr Ala Lys		
325	330	335
Ala Gly Ile Pro Leu Glu Val Met Trp Thr Asp Ile Asp Tyr Met Asp		
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Gly Tyr Lys Asp Phe Thr Leu Asp Pro Val Asn Phe Pro Glu Asp Lys		

355 360 365
 Met Gln Ser Phe Val Asp Thr Leu His Lys Asn Gly Gln Lys Tyr Val
 370 375 380
 Leu Ile Leu Asp Pro Gly Ile Gly Val Asp Ser Ser Tyr Gly Thr Tyr
 385 390 395 400
 Asn Arg Gly Met Glu Ala Asp Val Phe Ile Lys Arg Asn Gly Glu Pro
 405 410 415
 Tyr Leu Gly Glu Val Trp Pro Gly Lys Val Tyr Phe Pro Asp Phe Leu
 420 425 430
 Asn Pro Ala Ala Ala Thr Phe Trp Ser Asn Glu Ile Lys Met Phe Gln
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 Glu Ile Leu Pro Leu Asp Gly Leu Trp Ile Asp Met Asn Glu Leu Ser
 450 455 460
 Asn Phe Ile Thr Ser Pro Leu Ser Ser Gly Ser Ser Leu Asp Asp Pro
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 485 490 495
 Thr Val Pro Ala Thr Ser Ile His Phe Gly Asn Ile Ser Glu Tyr Asp
 500 505 510
 Ala His Asn Leu Tyr Gly Leu Leu Glu Ala Lys Ala Thr His Gln Ala
 515 520 525
 Val Val Asp Ile Thr Gly Lys Arg Pro Phe Ile Leu Ser Arg Ser Thr
 530 535 540
 Phe Val Ser Ser Gly Lys Tyr Thr Ala His Trp Thr Gly Asp Asn Ala
 545 550 555 560
 Ala Lys Trp Glu Asp Leu Ala Tyr Ser Ile Pro Gly Ile Leu Asn Phe
 565 570 575
 Gly Leu Phe Gly Ile Pro Met Val Gly Ala Asp Ile Cys Gly Phe Ser
 580 585 590
 His Asp Thr Thr Glu Glu Leu Cys Arg Arg Trp Ile Gln Leu Gly Ala
 595 600 605
 Phe Tyr Pro Phe Ala Arg Asp His Ser Ser Leu Gly Thr Ala Arg Gln

610 615 620
 Glu Leu Tyr Leu Trp Asp Ser Val Ala Ser Ser Ala Arg Lys Val Leu
 625 630 635 640
 Gly Leu Arg Met Arg Leu Leu Pro His Leu Tyr Thr Leu Met Tyr Glu
 645 650 655
 Ala His Val Ser Gly Asn Pro Ile Ala Arg Pro Leu Phe Phe Ser Phe
 660 665 670
 Pro Gln Asp Thr Lys Thr Tyr Glu Ile Asp Ser Gln Phe Leu Ile Gly
 675 680 685
 Lys Ser Ile Met Val Ser Pro Ala Leu Lys Gln Gly Ala Val Ala Val
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 Asp Ala Tyr Phe Pro Ala Gly Asn Trp Phe Asp Leu Phe Asn Tyr Ser
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 Phe Ala Val Gly Gly Asp Ser Gly Lys His Val Arg Leu Asp Thr Pro
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 Ala Asp His Val Asn Val His Val Arg Glu Gly Ser Ile Val Ala Met
 740 745 750
 Gln Gly Glu Ala Leu Thr Thr Arg Asp Ala Arg Lys Thr Pro Tyr Gln
 755 760 765
 Leu Leu Val Val Ala Ser Arg Leu Glu Asn Ile Ser Gly Glu Leu Phe
 770 775 780
 Leu Asp Asp Gly Glu Asn Leu Arg Met Gly Ala Gly Gly Gly Asn Arg
 785 790 795 800
 Asp Trp Thr Leu Val Lys Phe Arg Cys Tyr Val Thr Gly Lys Ser Val
 805 810 815
 Val Leu Arg Ser Glu Val Val Asn Pro Glu Tyr Ala Ser Lys Met Lys
 820 825 830
 Trp Ser Ile Gly Lys Val Thr Phe Val Gly Phe Glu Asn Val Glu Asn
 835 840 845
 Val Lys Thr Tyr Glu Val Arg Thr Ser Glu Arg Leu Arg Ser Pro Arg
 850 855 860
 Ile Ser Leu Ile Lys Thr Val Ser Asp Asn Asp Asp Pro Arg Phe Leu

865

870

875

880

Ser Val Glu Val Ser Lys Leu Ser Leu Leu Val Gly Lys Lys Phe Glu
885 890 895

Met Arg Leu Arg Leu Thr
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<211> 29

<212> DNA

<213> Artificial Sequence

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oligonucleotide

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<212> DNA

<213> Artificial Sequence

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oligonucleotide

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<210> 7

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:synthetic
oligonucleotide

<400> 7

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